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June 22, 1994

Dr. Robert Stachnik
 Optical/UV Astronomy Branch
 NASA Headquarters
 Washington DC 29546

Dear Bob,

This letter is my final technical report for my grant NAGW-3090, "Variability Analysis and the Structure of Active Galactic Nuclei". In its single year of funding, I worked on five topics of direct interest to this grant: interpretation of the multi-wavelength continuum variability study of the BL Lac object PKS2155-304; preparations for the HST monitoring campaign on NGC 5548, which took place in April-May, 1993; reanalysis of the line profile data from the IUE campaign on NGC 5548; crosscorrelation analysis of the lines and continuum light curves from the IUE campaign on NGC 3783; and development of new methods, based on regularized linear inversion techniques, for deconvolution of astronomical time series. In addition, I have initiated a new program which, while not strictly variability analysis, has direct logical connections to it: the nature of reprocessing in accretion disks. That this is an important effect was one of the most important consequences of the original IUE campaign on NGC 5548.

Papers written with partial support from this grant include:

Urry, C.M., Maraschi, L., Edelson, R., Koratkar, A., Krolik, J.H., ..., "Multiwavelength Monitoring of the BL Lac Object PKS 2155-304. I. The IUE Campaign", *Ap. J.* **411**, 614 (1993)

Reichert, G.A., Rodríguez-Pascual, P.M., Alloin, D., Clavel, J., Crenshaw, D.M., Kriss, G.A., Krolik, J.H., ..., "Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. V. Variability of the Ultraviolet Continuum and Emission Lines of NGC 3783", *Ap. J.* **425**, 582 (1994)

Edelson, R., Krolik, J., ..., "Intensive Multi-Wavelength Monitoring of the BL Lac Object PKS 2155-304: IV. Multi-Wavelength Analysis", *Ap. J.* in press (1994)

Życki, P., Krolik, J.H., Zdziarski, A.A., and Kallman, T.R., "X-ray Reflection from Photoionized Media in Active Galactic Nuclei", submitted to *Ap. J.* (1994)

Krolik, J.H. and Done, C., "Reverberation Mapping by Regularized Linear Inversion", submitted to *Ap. J.* (1994)

(NASA-CR-196285) VARIABILITY
 ANALYSIS AND THE STRUCTURE OF
 ACTIVE GALACTIC NUCLEI Final
 Technical Report (JHU) 2 p

N95-700

Unclassified

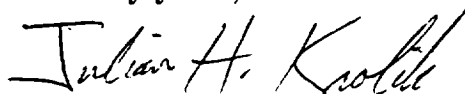
Korista, K.T., Alloin, D., Barr, P., Clavel, J., Cohen, R.D., Crenshaw, D.M., Evans, I.N., Horne, K., Koratkar, A.P., Kriss, G.A., Krolik, J.H., ... "Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei VIII: HST Monitoring of NGC 5548", in preparation (1994)

Kriss, G.A. and Krolik, J.H., "Reverberation Mapping of AGN Broad Line Regions", to appear in *The Physics of Active Galaxies*, G. Bicknell, ed.

Krolik, J.H., "The Structure of the Broad Emission Line Region as Shown by Variability Monitoring", in *IAU Symposium 159: AGN Across the Electromagnetic Spectrum*, A. Blecha and T. Courvoisier, eds. (Kluwer: Dordrecht) p. 163 (1994)

Krolik, J.H., "Conference Report: AGN: The Most Electromagnetically Nondiscriminatory Astronomical Objects", *Comments on Astrophysics* 17, 227 (1994)

Sincerely yours,

A handwritten signature in cursive script, reading "Julian H. Krolik". The signature is written in dark ink and is positioned above the printed name.

Julian H. Krolik

DOC NUMBER: 16779 INDEXING: SUBJECT/TERMS SCREEN
TITLE: Variability analysis and the structure of active g
alactic nuclei

CIN: BGB
KIN: EJS
AIN:

MAJOR TERMS:	SWITCH
1: ACTIVE GALACTIC NUCLEI_____	—
2: IUE_____	—
3: ULTRAVIOLET ASTRONOMY_____	—
4: ACCRETION DISKS_____	—
5: HUBBLE SPACE TELESCOPE_____	—
6: GALACTIC RADIATION_____	—
7: _____	—
8: _____	—
9: _____	—
10: _____	—
11: _____	—
12: _____	—
13: _____	—
14: _____	—
15: _____	—

MINOR TERMS:
1: VARIABILITY_____
2: CONTINUUMS_____
3: CROSS CORRELATION_____
4: INVERSIONS_____
5: TIME SERIES ANALYSIS_____
6: RECLAMATION_____
7: _____
8: _____
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10: _____
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14: _____
15: _____

PROPOSED TERMS:

_____	_____
_____	_____
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PF2=RESET; PF3=SIGNON; PF4=RELEASE; PF5=SELECTION; PF6=SUBQ
PF10=ALPHA; PF11=HIERARCHY; PF12=STORE; PF13=CENTRAL SCREEN; PF20=TITLE/WNF
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